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Measurement of the Hyperfine Splitting in the $2s_{1/2} - 2p_{3/2}$ X-Ray Transition in Bi^{80+} P. BEIERSDORFER, A. OSTERHELD, J. SCOFIELD, J. CRESPO LÓPEZ-URRUTIA, V. DECAUX, K. WIDMANN, LLNL — Recently, the first measurements were reported of the hyperfine transition in the $1s$ ground level of high- Z hydrogenic ions [1,2], i.e., Ho^{66+} and Bi^{82+} . These measurements have verified the importance of including the Breit-Schawlow, Bohr-Weisskopf, and QED corrections in determining the transition energy. We have made a high-resolution measurement of the $2s_{1/2} - 2p_{3/2}$ x-ray transition in Li-like Bi^{80+} ions that resolved the $F=4$ and $F=5$ splitting of the $1s^2 2s$ ground configuration, providing the first measurement of the splitting in a multi-electron highly charged ion. The measured value of 0.803 ± 0.031 eV is in good agreement with recent predictions of 0.800 ± 0.006 eV [3] and provides a first test of the contribution from the electron-electron correlation correction. The absolute transition energy of the two observed x-ray lines was measured with an accuracy of 9 ppm, providing a test of the $2s$ QED contribution with an accuracy exceeding that of past QED measurements in high- Z ions.

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[1] Klaft *et al.*, PRL **73**, 2425 (1994)

[2] Crespo López-Urrutia *et al.*, PRL **77**, 826 (1996).

[3] Shabaeva and Shabaev, PRA **52**, 2811 (1995).

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